

# Agricultural Chemicals

Data for the “Agricultural Chemical Usage Summaries” have been collected by the National Agricultural Statistics Service (NASS) since 1995. Information in these reports includes on-farm chemical use data for selected fruits, nuts, vegetables, and crops. In 2003, the Fruit Chemical Use Survey and the Field Crops Chemical Use Survey (FCCUS) were conducted to gather the information contained in the summaries. The FCCUS focused on potatoes, whereas the Fruit Chemical Use Survey in Washington gathered data for apples, pears, sweet cherries, grapes, and raspberries. Fruit chemical data summaries are available for odd numbered years and the most recent potato chemical data are available for 2003.

Both surveys had similar sampling schemes. The population of the Fruit Chemical Use Survey for Washington consisted of operations who historically had grown the targeted fruits. Potatoes were selected for the FCCUS. These producers were drawn from a list of farming operations managed by NASS. They were arranged by type of crop grown and size of farms. Special consideration during the selection process was given to rare commodities and those crops with very few growers. Each group or “stratum”, was given a separate priority of selection based upon the specific characteristics of the group. Each farm could be associated with only one stratum. Every farm in the population had a chance of being selected to be in the sample. The final sample size was determined by the number of reports needed to provide accurate chemical use estimates at the state

level. After the farms were chosen, operators or managers were personally interviewed to obtain production practices on a randomly selected part of the operation. Starting with the first application after the 2001 crop was harvested, applications were gathered for chemicals that were applied to all targeted crops. Fertilizer data was collected for all crops. Chemicals that were applied were recorded by product or trade name. A thorough review compared reported data with manufacturer label recommendations. A comparison was also made with data from other farm operators using the same product. Following this review, product information was converted to the active ingredient. This formed the basis of the estimates presented in the summaries.

The chemical use surveys were funded through the USDA Pesticide Data Program. This multi-agency program provides reliable pesticide use statistics and enhances the quality of information on pesticide residues in food. The data series addresses the increased public interest in agricultural chemical use and provides the means for government agencies to respond effectively to food safety and water quality issues. The implementation of the Food Quality Protection Act (FQPA), in 1996, and other legislation increased the need for reliable chemical use data. The FQPA mandates an accelerated review of all pesticide products before they can be re-registered for use on specific crops. A complete copy of the summaries can be found on the Washington Agricultural Statistics Service homepage at [www.nass.usda.gov/wa/](http://www.nass.usda.gov/wa/).

## Agricultural Chemicals: Pesticide Usage, Washington, 2001 and 2003

Crop	Bearing Acreage		Area Receiving 1/							
			Herbicide		Insecticide		Fungicide		Other Chemicals 2/	
	2001	2003	2001	2003	2001	2003	2001	2003	2001	2003
<b>FRUIT:</b>	Acres		Percent							
Apples	168,000	162,000	54	42	98	99	82	92	86	23
Sweet Cherries	22,000	26,000	37	23	94	98	93	96	62	23
Grapes	48,000	52,000	75	60	45	48	51	50	2/	2/
Pears	24,800	24,800	44	33	90	96	80	87	50	21
<b>BERRIES:</b>										
Raspberries	9,500	9,200	91	93	90	95	98	96	2/	2/
<b>FIELD CROPS</b>	Planted Acres									
Fall Potatoes	160,000	163,000	92	94	95	97	91	99	78	77

1/ Refers to acres receiving one or more applications of a specific pesticide class.

2/ Insufficient reports to publish data for other chemicals.

## Apples: Fertilizer Applications, Total Acreage & Percentage Receiving Applications, Major States & Total, 2001 and 2003 1/

State	Planted Acreage		Area Receiving 2/					
			Nitrogen		Phosphate		Potash	
	2001	2003	2001	2003	2001	2003	2001	2003
	Acres		Percent					
California	30,000	27,000	-	70	-	12	-	16
Michigan	44,500	42,000	-	66	-	24	-	44
New York	55,000	41,000	-	66	-	33	-	71
North Carolina	8,000	7,000	-	93	-	92	-	92
Oregon	8,700	6,500	-	81	-	50	-	53
Pennsylvania	23,000	20,000	-	49	-	35	-	45
Washington	168,000	162,000	-	74	-	26	-	24
<b>TOTAL</b>	<b>337,600</b>	<b>305,500</b>	-	<b>71</b>	-	<b>28</b>	-	<b>36</b>

1/ Fertilizers were not surveyed in 2001. 2/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

## Apples: Agricultural Chemical Applications, Washington, 2001 and 2003 1/

Active Ingredient 2/	Area Applied		Applications		Rate Per Application		Rate Per Crop Year		Total Applied	
	2001	2003	2001	2003	2001	2003	2001	2003	2001	2003
<b>Fertilizer:</b>	Percent		Number		Pounds Per Acre				1,000 Lbs.	
Nitrogen	-	74	-	2.1	-	24	-	51	-	6,114
Phosphate	-	26	-	1.5	-	11	-	17	-	729
Potash	-	24	-	1.7	-	12	-	21	-	810
<b>Herbicides:</b>										
2, 4-D	4	5	1.0	1.3	1.29	0.74	1.36	0.98	10.2	8.1
2, 4-D, Dimeth. salt	7	2	1.2	1.1	0.38	0.79	0.48	0.89	5.9	3.2
Diuron	1	3	1.0	1.0	1.53	1.05	1.56	1.06	2.7	4.8
Glyphosate	41	39	1.4	1.8	1.08	1.07	1.58	1.94	109.7	122.8
Norflurazon	15	8	1.0	1.0	1.35	1.44	1.41	1.53	35.6	20.9
Oryzalin	6	*	1.0	1.2	1.78	1.80	1.88	2.16	20.2	1.2
Oxyfluorfen	5	2	1.0	1.1	1.05	1.14	1.14	1.30	9.0	4.3
Paraquat	22	12	1.3	1.3	0.68	0.67	0.89	0.89	32.6	17.2
Pendimethalin	-	*	-	2.3	-	1.29	-	3.05	-	0.7
Simazine	9	6	1.0	1.1	2.19	1.84	2.28	2.10	35.0	20.7
Sulfosate	4	-	1.3	-	2.20	-	3.01	-	22.6	-
<b>Insecticides:</b>										
Abamectin	-	1	-	1.0	-	0.01	-	0.01	-	**
Acetamiprid	-	25	-	1.4	-	0.12	-	0.17	-	7.1
Azadirachtin	*	-	1.0	-	0.01	-	0.01	-	**	-
Azinphos-methyl	73	78	2.0	2.2	0.94	1.01	1.96	2.29	241.4	289.2
Benzoic acid	17	29	1.1	1.1	0.24	0.21	0.26	0.25	7.6	11.6
Bifenazate	-	3	-	1.0	-	0.37	-	0.40	-	1.7
Bt (Bacillus thur.)	12	9	1.6	1.4	3/	3/	3/	3/	3/	3/
Carbaryl	67	52	1.4	1.4	1.25	1.38	1.78	1.94	201.9	162.5
Chlorpyrifos	68	63	1.1	1.1	1.81	1.85	2.04	2.12	234.0	217.0
Clofentezine	9	2	1.0	1.0	0.15	0.12	0.17	0.13	2.6	0.4
Diazinon	2	2	1.0	1.2	1.95	1.59	2.05	1.98	5.7	5.1
Dimethoate	*	-	1.1	-	1.27	-	1.44	-	1.8	-
Endosulfan	6	9	1.1	1.0	1.98	1.93	2.36	2.03	25.7	28.4

See footnotes at end of table (next page).

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# Apples: Agricultural Chemical Applications, Washington, 2001 and 2003 1/ (continued)

Active Ingredient 2/	Area Applied		Applications		Rate Per Application		Rate Per Crop Year		Total Applied	
	2001	2003	2001	2003	2001	2003	2001	2003	2001	2003
<b>Insecticides (continued):</b>	<b>Percent</b>		<b>Number</b>		<b>Pounds Per Acre</b>				<b>1,000 Lbs.</b>	
Fenbutatin-oxide	5	1	1.0	1.0	0.87	0.76	0.88	0.78	8.0	1.6
Formetanate hydro.	13	14	1.0	1.0	0.74	0.83	0.81	0.87	17.0	20.0
Imidacloprid	38	45	1.2	1.4	0.06	0.05	0.08	0.08	4.8	5.8
Kaolin	8	11	1.2	1.4	29.48	37.04	36.65	54.59	509.4	973.6
Malathion	1	-	1.1	-	0.75	-	0.84	-	1.6	-
Petroleum distillate	79	80	1.6	2.0	21.90	18.90	36.47	38.02	4,858.4	4,946.7
Phosmet	18	12	1.5	1.2	3.06	2.90	4.57	3.50	138.3	70.7
Pyrethrins	-	1	-	1.6	-	0.06	-	0.09	-	0.2
Pyridaben	7	8	1.2	1.0	0.22	0.25	0.27	0.26	3.3	3.2
Pyriproxyfen	*	*	1.2	1.0	0.11	0.08	0.14	0.08	0.2	0.1
Spinosad	50	40	1.3	1.4	0.10	0.10	0.14	0.15	12.0	9.5
Thiamethoxam	-	2	-	1.2	-	0.07	-	0.09	-	0.3
<b>Fungicides:</b>										
Bacillus subtilis	-	*	-	1.0	-	3/	-	3/	-	3/
Basic copper sulfate	-	2	-	1.2	-	0.39	-	0.47	-	1.4
Calcium polysulfide	14	22	1.2	1.3	20.82	19.42	25.34	26.84	613.9	938.2
Captan	-	*	-	1.1	-	2.69	-	3.04	-	4.4
Copper hydroxide	13	10	1.1	1.2	1.33	1.71	1.50	2.06	31.5	32.8
Fenarimol	17	27	1.1	1.1	0.07	0.07	0.08	0.08	2.4	3.5
Fosetyl-al	6	3	1.2	1.3	1.51	2.34	1.88	3.14	19.7	17.5
Kresoxim-methyl	14	5	1.1	1.0	0.15	0.15	0.17	0.16	3.9	1.3
Mancozeb	13	13	1.2	1.3	3.18	3.70	3.82	5.07	82.1	106.0
Mefenoxam	4	*	1.2	1.6	0.63	1.51	0.76	2.50	4.8	1.5
Myclobutanil	36	48	1.3	1.6	0.12	0.11	0.16	0.19	9.9	14.5
Oxytetracycline	17	9	1.2	1.3	0.18	0.18	0.22	0.24	6.4	3.4
Potassium bicarbonate	-	3	-	1.1	-	2.40	-	2.76	-	14.4
Pseudomonas fluores.	-	4	-	1.4	-	0.24	-	0.36	-	2.1
Streptomycin	-	3	-	1.6	-	0.21	-	0.34	-	1.7
Sulfur	48	33	1.4	1.4	6.52	7.70	9.32	10.88	756.5	578.5
Thiram	-	4	-	1.0	-	3.28	-	3.43	-	23.9
Triadimefon	6	5	1.0	1.4	0.18	0.23	0.18	0.33	1.9	2.4
Trifloxystrobin	9	15	1.2	1.1	0.06	0.07	0.07	0.08	1.1	2.1
Triflumizole	42	37	1.3	1.3	0.27	0.24	0.36	0.33	25.6	19.5
Ziram	3	8	1.0	1.0	3.86	3.90	4.10	4.27	21.0	57.1
<b>Other Chemicals:</b>										
Benzyladenine	32	29	1.1	1.1	0.03	0.03	0.03	0.03	1.9	1.5
Butenic Acid Hydro.	8	11	1.0	1.0	0.10	0.09	0.10	0.10	1.4	1.7
Chlorophacinone	1	-	1.0	-	0.06	-	0.06	-	0.1	-
Cytokinins	3	3	1.0	1.2	5/	4/	5/	4/	**	**
Dodecadien-1-ol	26	34	1.0	1.0	0.06	0.05	0.06	0.06	2.8	3.2
Dodecanol	21	31	1.0	1.0	0.03	0.03	0.04	0.03	1.2	1.5
Ethephon	31	30	1.2	1.9	0.59	0.44	0.70	0.83	36.6	40.8
Gibberellic acid	3	1	1.2	1.1	0.03	0.02	0.04	0.02	0.2	**
Gibberellins A4A7	32	28	1.1	1.1	0.03	0.02	0.03	0.03	1.8	1.3
Monocarbamide dihy.	2	-	1.0	-	5.10	-	5.12	-	13.3	-
NAA	40	41	1.2	1.3	0.03	0.03	0.03	0.03	2.1	2.3
NAA, Potassium salt	7	-	1.1	-	0.04	-	0.05	-	0.6	-
NAD	13	13	1.1	1.1	0.05	0.06	0.06	0.07	1.3	1.5
Pelargonic acid	*	-	1.0	-	0.96	-	1.00	-	0.7	-
Prohexadione calcium	5	13	1.4	1.5	0.24	0.28	0.34	0.41	2.6	8.4
Tetradecanol	21	31	1.0	1.0	0.007	0.006	0.007	0.006	0.2	0.3
Zinc phosphide	4	3	1.0	1.0	0.19	0.11	0.20	0.11	1.4	0.6

Note: Data may not multiply across due to rounding. \* Area applied is less than 0.5 percent. \*\* Total applied is less than 50 pounds.

1/ Bearing acres in 2001 in Washington were 172,000 acres and bearing acres in 2003 in Washington were 162,000 acres. 2/ Insufficient reports to publish data for the following agricultural chemicals: 2001; Herbicides: 2, 4-DP, Dimeth. salt, Dinoseb, Glufosinate-ammonium, Hexazinone, Napropamide, Pendimethalin, Pronamide, Prosulfuron, Terbacil. 2001; Insecticides: Abamectin, Carbophenothion, Cyd-X Granulo. Virus, Dicofof, Esfenvalerate, Ethion, Ethyl parathion, Fenpropathrin, Hexythiazox, Indoxacarb, Methidathion, Methomyl, Methoxychlor, Oxamyl, Oxythioquinox, Permethrin, Phosphamidon, Potassium salts, Pyrethrins, Tebufenozide, Thiamethoxam. 2001; Fungicides: Azoxystrobin, Benomyl, Captan, Copper chloride hyd., Copper sulfate, Cyprodinil, Dichlone, Dodine, Maneb, Potassium bicarbon., Propiconazole, Pseudomonas fluores., Streptomycin, Tebuconazole, Thiophanate-methyl, Thiram, Vinclozolin. 2001; Other Chemicals: Aluminum phosphide, Chloropicrin, Dichloropropene, Diphacinone, E-8-Dodecenyl acetat, Garlic oil, Gossypure, Harpin protein, Indolebutyric acid, Lactic acid, Metam-sodium, Strychnine, Tetradecen-1-OL (Z), Tetradecen-1-yl (E), Z-8-Dodecanol, Z-8-Dodecen acetate. 2003; Herbicides: Atrazine, Dichlobenil, Glufosinate-ammonium, Glyphosate diam salt, Napropamide, Prometryn, Pronamide, Sulfosate. Insecticides: Amitraz, Azadirachtin, Cyd-X Granulo. Virus, Dicofof, Diflubenzuron, Dimethoate, Esfenvalerate, Ethion, Ethyl parathion, Fenpropathrin, Hexythiazox, Indoxacarb, Lambda-cyhalothrin, Malathion, Methidathion, Methomyl, Methyl parathion, Oxamyl, Oxythioquinox, Permethrin, Phosphamidon, Piperonyl butoxide, Potassium salts, Ryania, Tebufenozide. Fungicides: Copper chloride hyd., Copper sulfate, Cyprodinil, Maneb, Phosphorous acid, Propiconazole, Pyraclostrobin, Thiophanate-methyl, Vinclozolin. Other Chemicals: Aluminum phosphide, Chlorophacinone, Chloropicrin, DNOC, Decenol, Decenyl acetate, Dichloropropene, E-8-Dodecenyl acetat, Harpin protein, Monocarbamide dihyd., Strychnine, Tetradecen-1-OL (Z), Z-8-Dodecanol, Z-8 Dodecen acetate.

3/ Rates and total applied are not available because amounts of active ingredients are not comparable between products.

4/ Rate per acre is less than 0.005 lbs.

5/ Rates and total applied are not available because amounts of active ingredients are too small.